

Claims

1. A shrink film comprising a polyethylene film, characterized in that said polyethylene is an ethylene copolymer mixture having a molecular weight distribution in the range 10 to 35, a density of 915 to 940 kg/m³, a weight average molecular weight of at least 100000 D and an MFR_{2,16} (190°C) of 0.1 to 0.9 kg/m³, which copolymer mixture is produced by a two or more stage copolymerization of ethylene and 2 to 10% mole (relative to ethylene) of a C₃₋₁₂ alpha-olefin comonomer in a series of reactors including at least one slurry loop reactor and at least one gas phase reactor using a heterogeneous Ziegler-Natta catalyst.
- 15 2. A shrink film as claimed in claim 1 wherein the molecular weight of the copolymer is 150000 to 300000D.
- 20 3. A shrink film as claimed in claim 1 wherein the molecular weight of the copolymer is at least 226,000 D.
- 25 4. A shrink film as claimed in any one of claims 1 to 3 wherein the MWD of the copolymer is between 15 and 23.
- 30 5. A shrink film as claimed in any one of claims 1 to 4 wherein said copolymer is bimodal and comprises a lower molecular weight component and a higher molecular weight component.
- 35 6. A shrink film as claimed in any one of claims 1 to 5 wherein said copolymer comprises a lower molecular weight component and a higher molecular weight component both formed from an ethylene/butene copolymer.
7. A shrink film as claimed in any one of claims 1 to 6 wherein the density of the lower molecular weight component is at least 945 kg/m³.

8. A shrink film as claimed in any one of claims 1 to
7 wherein the MFR_2 of the copolymer is 0.15 to 0.6
g/10min.

5 9. A shrink film as claimed in any one of claims 1 to
8 wherein the value of a films' dart drop (g)/thickness
(μm) is at least 4.5.

10. A shrink film as claimed in any one of claims 1 to
9 wherein said film has a thickness of 20 to 120 μm .

11. A shrink film as claimed in any one of claims 1 to
10 wherein said shrink film is a multilayer film.

15 12. A shrink film as claimed in any one of claims 1 to
10 wherein said shrink film is unilamellar.

13. A shrink film as claimed in claim 12 having a
thickness of 100 to 200 μm .

20 14. Use of polyethylene film comprising an ethylene
copolymer mixture having a molecular weight distribution
in the range 10 to 35, a density of 915 to 940 kg/m^3 , a
weight average molecular weight of at least 100000 D and
25 an $MFR_{2,16}$ (190°C) of 0.1 to 0.9 kg/m^3 , which copolymer
mixture is produced by a two or more stage
copolymerization of ethylene and 2 to 10% mole (relative
to ethylene) of a C_{3-12} alpha-olefin comonomer in a series
of reactors including at least one slurry loop reactor
30 and at least one gas phase reactor using a heterogeneous
Ziegler-Natta catalyst in the manufacture of a shrink
film.

35 15. A process for wrapping an object comprising
applying a shrink film about said object and shrinking
said film by the application of heat thereto,
characterized in that said film is a shrink film

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according to claim 1 to 13.

16. An object shrink wrapped with a shrink film according to claim 1 to 13.

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17. A polyolefin shrink film having a Dart drop value (g)/film thickness (μm) of 5 g/ μm or more.

18. The shrink film of claim 17 comprising an ethylene copolymer/copolymer mixture.

19. The shrink film of claim 17 or 18 wherein the film is unilamellar.

15 20. The shrink film of claim 17 to 19 wherein Dart drop value (g)/film thickness (μm) is 6 g/ μm or more.